

ABSTRACT

Embodiments of the present invention feature a method and apparatus for detecting
5 defects, such as, leaks, component failure and adverse performance. One embodiment of
the present apparatus for pumping fluid comprises a pumping chamber having an inlet and
an outlet powered by a motor. The motor operates in pumping mode upon receiving a
pumping signal. The apparatus further comprises at least one inlet valve in fluid
communication with the inlet of the pumping chamber. And, the apparatus comprises a
10 switchable valve in fluid communication with the outlet of the pumping chamber. The
switchable valve has a closed position and an open position, and assumes the closed
position upon receiving a close signal. A pressure measuring device is in fluid
communication with the pumping chamber, between said inlet valve and switchable valve.
The pressure measuring device determines a minimal pressure and first threshold pressure
15 at a first time and a second threshold pressure at a second time. The control means
calculates the slope of a line representing the difference of said first threshold pressure
signal and said second threshold pressure signal over time and comparing the slope with a
threshold decay value. And, the control means compares the minimal pressure to a
minimal acceptable value. Deviations from such values represent a defect in the pump.

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